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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/578,001

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Shunpei Yamazaki

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EXAMINER

KARIMY, MOHAMMAD TIMOR

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/578,001	<b>Applicant(s)</b> YAMAZAKI ET AL.	
	<b>Examiner</b> MOHAMMAD Timor KARIMY	<b>Art Unit</b> 2894	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 February 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02/13/2009 has been entered.

### ***Product-by-Process Limitations***

2. While not objectionable, the Office reminds applicant that “product by process” limitations in claims drawn to structure are directed to the product, per se, no matter how actually made. In re *Hirao*, 190 USPQ 15 at 17 (footnote 3). See also, in re *Brown*, 173 USPQ 685; In re *Luck*, 177 USPQ 523; In re *Fessmann*, 180 USPQ 324; In re *Avery*, 186 USPQ 161; In re *Wethheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); In re *Marosi et al.*, 218 USPQ 289; and particularly In re *Thorpe*, 227 USPQ 964, all of which make it clear that it is the patentability of the final product per se which must be determined in a “product by process” claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in “product by process” claims or otherwise. Note that applicant has the burden of proof in such cases, as the above case law makes

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clear. Thus, no patentable weight will be given to those process steps which do not add structural limitations to the final product.

### ***Claim Objections***

4. Claims 1-8 are objected to because of the following informalities:

Claim 1 recites the limitations "the opening" in line 3 and "the first conductive" in line 8. There are insufficient antecedent basis for these limitations in the claim.

Claim 2 recites the limitations "the opening" in line 3 and "the first conductive" in line 7. There are insufficient antecedent basis for these limitations in the claim.

Claims 3 and 4 recite the limitation "the first conductive" in line 12. There is insufficient antecedent basis for this limitation in the claims.

Claims 4 and 6 recite the limitation "the first conductive" in line 13. There is insufficient antecedent basis for this limitation in the claims.

Claims 7 and 8 recite the limitation "the first conductive" in line 13. There is insufficient antecedent basis for this limitation in the claims.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-8, 9-10, 16 and 18-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Nishio et al. (US Patent 6,046,547).

With respect to claim 1, Nishio discloses in figures 1-10, a thin film transistor comprising:

an insulating layer 505 having a first opening (Fig. 9C);

a first conductive layer 501b fitted in **the opening** (Fig. 9C);

a second conductive layer (lower portions of 501a in layer 504) on and in contact with the first insulating layer 505 and the first conductive layer 501a;

wherein **the first conductive** 501a is thicker than the second conductive layer in a vertical direction (Fig. 9C), and

wherein the surface of the insulating layer 505 and the first conductive layer is planarized (Fig. 9C).

With respect to claim 2, Nishio discloses in figures 1-10, a thin film transistor comprising:

an insulating layer 505 having a first opening (Fig. 9C);

a first conductive layer 501b fitted in **the opening** (Fig. 9C);

a second conductive layer (lower portions of 501a in layer 504) on and in contact with the first insulating layer 505 and the first conductive layer 501a;

wherein **the first conductive** 501a is thicker than the second conductive layer in a vertical direction (Fig. 9C), and

wherein the surface of the insulating layer 505 and the first conductive layer is planarized (Fig. 9C).

It is worth mentioning that the limitation "**wherein the second conductive layer is formed by a droplet discharge method using a conductive material**" is a product by process limitation and it does not result to a structurally distinguishable product over the prior art.

With respect to claim 3, Nishio discloses in figures 1-10, a display device comprising:

- a first insulating layer 505 having a first opening (Fig. 9C);
  - a first conductive layer 501b fitted in the first opening (Fig. 9C);
  - a second conductive layer (lower portions of 501a in layer 504) on and in contact with the first insulating layer 505 and the first conductive layer 501a (Fig. 9C);
  - a semiconductor layer (3a-3c) over the second conductive layer with a gate insulating film 12 therebetween (Fig. 9C);
  - a third conductive layer (see Fig. 9C below) over the semiconductor layer;
  - a second insulating layer 14 having a second opening over the third conductive layer; and
  - a fourth conductive layer (portions of 510 in layer 14) fitted in the second opening (Fig. 9C);
- wherein **the first conductive** 501a is thicker than the second conductive layer in a vertical direction (Fig. 9C), and

wherein the surface of the insulating layer 505 and the first conductive layer is planarized (Fig. 9C), and

wherein the fourth conductive layer is thicker than the third conductive layer (see Fig. 9C below).

With respect to claim 4, Nishio discloses in figures 1-10, a display device comprising:

- a first insulating layer 505 having a first opening (Fig. 9C);

- a first conductive layer 501b fitted in the first opening (Fig. 9C);

- a second conductive layer (lower portions of 501a in layer 504) on and in contact with the first insulating layer 505 and the first conductive layer 501a (Fig. 9C);

- a semiconductor layer (3a-3c) over the second conductive layer with a gate insulating film 12 therebetween (Fig. 9C);

- a third conductive layer (see Fig. 9C below) over the semiconductor layer;

- a second insulating layer 14 having a second opening over the third conductive layer; and

- a fourth conductive layer (portions of 510 in layer 14) fitted in the second opening (Fig. 9C);

wherein **the first conductive** 501a is thicker than the second conductive layer in a vertical direction (Fig. 9C), and

wherein the surface of the insulating layer 505 and the first conductive layer is planarized (Fig. 9C), and

wherein the fourth conductive layer is thicker than the third conductive layer (see Fig. 9C below).

It is worth mentioning that the limitation "**wherein each of the second conductive layer and the third conductive layer is formed by a droplet discharge method using a conductive material**" is a product by process limitation and it does not result to a structurally distinguishable product over the prior art.

With respect to claim 5, Nishio discloses in figures 1-10, a display device comprising:

- a first insulating layer 505 having a first opening (Fig. 9C);
  - a first conductive layer 501b fitted in the first opening (Fig. 9C);
  - a second conductive layer (lower portions of 501a in layer 504) on and in contact with the first insulating layer 505 and the first conductive layer 501a (Fig. 9C);
  - a semiconductor layer (3a-3c) over the second conductive layer with a gate insulating film 12 therebetween (Fig. 9C);
  - a pair of third conductive layer (see Fig. 9C below) over the semiconductor layer;
  - a first electrode (layer 506 in layer 507) over one of the pair of third conductive layer (Fig. 9C);
  - an electroluminescent layer 507 over the first electrode; and
  - a second electrode 511 over the electroluminescent layer,
- wherein **the first conductive** 501a is thicker than the second conductive layer in a vertical direction (Fig. 9C), and



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wherein the surface of the insulating layer 505 and the first conductive layer is planarized (Fig. 9C).

With respect to claim 6, Nishio discloses in figures 1-10, a display device comprising:

- a first insulating layer 505 having a first opening (Fig. 9C);
  - a first conductive layer 501b fitted in the first opening (Fig. 9C);
  - a second conductive layer (lower portions of 501a in layer 504) on and in contact with the first insulating layer 505 and the first conductive layer 501a (Fig. 9C);
  - a semiconductor layer (3a-3c) over the second conductive layer with a gate insulating film 12 therebetween (Fig. 9C);
  - a pair of third conductive layer (see Fig. 9C below) over the semiconductor layer;
  - a first electrode (layer 506 in layer 507) over one of the pair of third conductive layer (Fig. 9C);
  - an electroluminescent layer 507 over the first electrode; and
  - a second electrode 511 over the electroluminescent layer,
- wherein **the first conductive** 501a is thicker than the second conductive layer in a vertical direction (Fig. 9C), and
- wherein the surface of the insulating layer 505 and the first conductive layer is planarized (Fig. 9C).

It is worth mentioning that the limitation "**wherein the second conductive layer is formed by a droplet discharge method using a conductive material**" is a product

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by process limitation and it does not result to a structurally distinguishable product over the prior art.

With respect to claim 7, Nishio discloses in figures 1-10, a display device comprising:

- a first insulating layer 505 having a first opening (Fig. 9C);
  - a first conductive layer 501b fitted in the first opening (Fig. 9C);
  - a second conductive layer (lower portions of 501a in layer 504) on and in contact with the first insulating layer 505 and the first conductive layer 501a (Fig. 9C);
  - a semiconductor layer (3a-3c) over the second conductive layer with a gate insulating film 12 therebetween (Fig. 9C);
  - a pair of third conductive layer (see Fig. 9C below) over the semiconductor layer;
  - a first electrode (layer 506 in layer 507) over one of the pair of third conductive layer (Fig. 9C);
  - a second insulating layer 14 having a second opening over the third conductive layer; and
  - a fourth conductive layer (portions of 510 in layer 14) fitted in the second opening (Fig. 9C);
  - an electroluminescent layer 507 over the first electrode; and
  - a second electrode 511 over the electroluminescent layer,
- wherein **the first conductive** 501a is thicker than the second conductive layer in a vertical direction (Fig. 9C), and

wherein the surface of the insulating layer 505 and the first conductive layer is planarized (Fig. 9C), and

wherein the fourth conductive layer is thicker than the pair of third conductive layer (see Fig. 9C below).

With respect to claim 8, Nishio discloses in figures 1-10, a display device comprising:

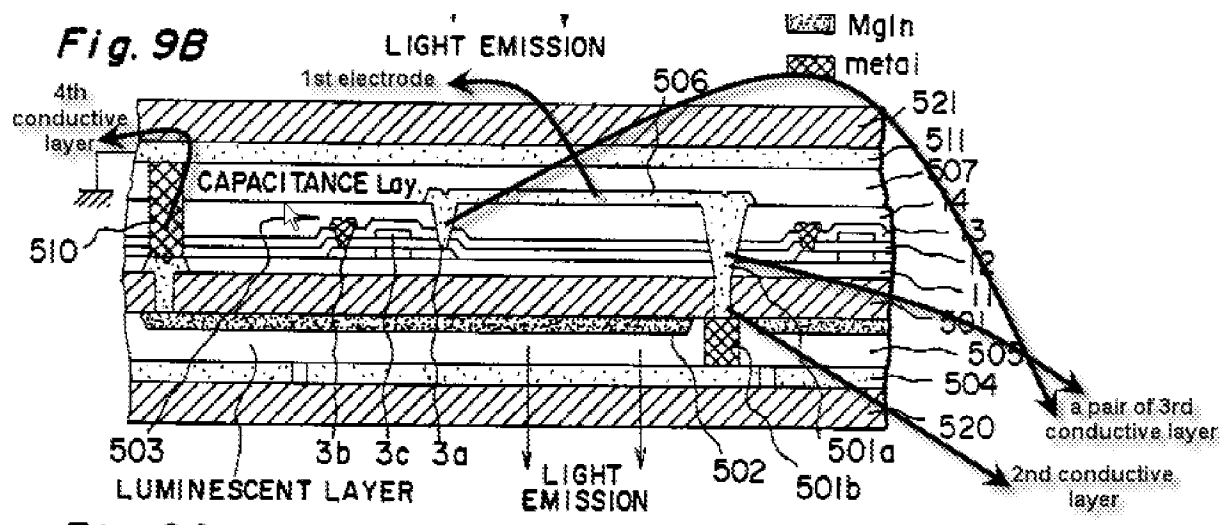
- a first insulating layer 505 having a first opening (Fig. 9C);
- a first conductive layer 501b fitted in the first opening (Fig. 9C);
- a second conductive layer (lower portions of 501a in layer 504) on and in contact with the first insulating layer 505 and the first conductive layer 501a (Fig. 9C);
- a semiconductor layer (3a-3c) over the second conductive layer with a gate insulating film 12 therebetween (Fig. 9C);
- a pair of third conductive layer (see Fig. 9C below) over the semiconductor layer;
- a first electrode (layer 506 in layer 507) over one of the pair of third conductive layer (Fig. 9C);
- a second insulating layer 14 having a second opening over the third conductive layer; and
- a fourth conductive layer (portions of 510 in layer 14) fitted in the second opening (Fig. 9C);
- an electroluminescent layer 507 over the first electrode; and
- a second electrode 511 over the electroluminescent layer,

wherein **the first conductive** 501a is thicker than the second conductive layer in a vertical direction (see Fig. 9C below), and

wherein the surface of the insulating layer 505 and the first conductive layer is planarized (Fig. 9B), and

wherein the fourth conductive layer is thicker than the pair of third conductive layer (see Fig. 9B below).

It is worth mentioning that the limitation "**wherein each of the second conductive layer and the third conductive layer is formed by a droplet discharge method using a conductive material**" is a product by process limitation and it does not result to a structurally distinguishable product over the prior art.



With respect to claim 9, Nishio teaches column 16 and lines 61-62 the thin film transistor according to any of claim 1 to 8, wherein the thin film transistor or display device further comprising titanium oxide below the first conductive layer.

With respect to claim 10, Nishio teaches in column 6 and lines 14-16 the thin film transistor according to any of claims 1 to 8, wherein the thin film transistor or display device further comprises a film comprising aluminum.

With respect to claim 16, Nishio teaches the thin film transistor according to any of claims 3 to 8, wherein the semiconductor layer is a polycrystalline semiconductor (Fig. 9C).

With respect to claims 18, Hashimoto implicitly teaches in Fig. 9C the thin film transistor of claims 3 to 8, wherein a television apparatus can include the thin film transistor.

Moreover, it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex Parte Masham, 2 USPQ F.2d 1647 (1987).

With respect to claims 19, Hashimoto implicitly teaches in Fig. 9C the thin film transistor of claims 3 to 8, wherein a television apparatus can include the thin film transistor.

Moreover, it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex Parte Masham, 2 USPQ F.2d 1647 (1987).

***Claim Rejections - 35 USC § 103***

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7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishio as applied to claims 1-8 above, and in view of Yamazaki et al. (US Pub. 2002/0132396 A1).

With respect to claims 11-12, Nishio does not teach copper as the material used for the second conductive layer; however, the use of copper in conductive wiring is known to those of ordinary skill in the art because of copper's high electrical conductivity. For instance, Yamazaki ('396) discusses the use of copper wiring for electric connection. As such, the use of copper in conductive wiring is within the knowledge of one of ordinary skill in the art.

9. Claims 13 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishio as applied to claims 1 to 8 above.

With respect to claims 13 and 17, Nishio does not disclose a range of from 5 to 100  $\mu\text{m}$  for an opening containing the conductive layer or a channel width.

Notwithstanding, one of ordinary skill in the art would have been led to the recited dimensions through routine experimentation and optimization. Applicant has not disclosed that the dimensions are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical, and it appears prima facie that the process

would possess utility using another dimension. Indeed, it has been held that mere dimensional limitations are prima facie obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. See, for example, *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

10. Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishio as applied to claims 1-8 above, and in further view of Young (US Pub. 20010013913 A1).

With respect to claims 14-15, Nishio does not teach the use amorphous or semi-amorphous silicon in the semiconductor layer; nonetheless, it is widely known in the semiconductor art to use amorphous semiconductor in TFT active areas. For instance, Young discusses in Fig. 4 amorphous semiconductor gate structures. Therefore, the use of amorphous semiconductor material in TFT active regions would have been obvious to one of ordinary skill in the art.

### ***Response to Arguments***

11. Applicant's arguments filed 02/13/2009, have been fully considered but they are moot in view of new grounds of rejection.

***Conclusion***

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mohammad Timor Karimy whose telephone number is 571-272-9006. The examiner can normally be reached on 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly Nguyen can be reached on 571-272-2402. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

mtk

/Kimberly D Nguyen/  
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